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10/803,339

03/17/2004

Kong Leong Teng

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EXAMINER

TRAN, MY CHAU T

ART UNIT

PAPER NUMBER

2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/803,339	Applicant(s) TENG, KONG LEONG	
	Examiner MY-CHAU T. TRAN	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Application and Claims Status

1. Claims 1-20 are currently pending and are under consideration in this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 7 recites the limitation "*phases shifts*" in line 1. There is insufficient antecedent basis for this limitation in the claims 1 and 6. Neither claim 1 nor claim 6 recites the limitation of "*phases shifts*".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Glynn (US Patent 5,181,181).

For *claims 1, 2, 13, and 14*, Glynn discloses a mouse (refers to instant claimed an *image control accelerometer system*), which senses the movement of the mouse within three dimensions such that a user can interact with a computer in three-dimensional space (see e.g. Abstract; col. 1, lines 6-21; col. 3, lines 3-18; col. 5, lines 4-56). As illustrated in figure 1, the mouse comprises a motion sensing assembly (ref. #2), an ancillary components area (ref. #3), and a plurality of push-buttons (ref. #4-6) that function to indicate a desire by the user to indicate a point, line, surface, volume or motion in space, or to select a menu item, cursor position or particular attitude (see e.g. col. 5, lines 4-56). As illustrated in figures 2-3; the motion sensing assembly that includes rotational rate sensors (ref. # 14-16) and accelerometers (ref. #17-19)(refers to instant claimed an *accelerometer module / accelerometer*)(see e.g. col. 6, lines 3-46; Claims 4, 5, 19, and 20; figs. 2-3). As illustrated in figure 4, the ancillary components area comprises a sensor interface circuits (ref. #31)(refers to instant claimed a *movement analysis module / logic circuit*) that reads and integrates the sensor signals from the motion sensing assembly, and interface ports (ref. #7-12)(refers to instant claimed an *input protocol generation module / input protocol generation component*) that provide communication with computer via the computer (see e.g. col. 5, lines 1-14; col. 6, line 32 thru col. 7, line 50; claims 4, 5, 19, and 20; fig. 4).

Therefore, the mouse of Glynn does anticipate the instant claimed invention.

6. Claims 1, 2, 4, 5, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Olson (US Patent 4,787,051).

For **claims 1, 2, 13, and 14**, Olson discloses an input device (refers to instant claimed an *image control accelerometer system*)(see e.g. Abstract; col. 2, lines 38-62). As illustrated in figure 1, the device comprises a set of accelerometers (ref. #14, 16, 18)(refers to instant claimed an *accelerometer module / accelerometer*), and an electronic signal processing, transmitting, and receiving circuitry (ref. #26)(see e.g. col. 4, lines 26-45; col. 4, lines 49 thru col. 5, line 22; claims 1 and 4-6). As illustrated in figure 4, the signal processing, transmitting, and receiving circuitry comprises integrators (ref. #32, 42, and 44)(refers to instant claimed a *movement analysis module / logic circuit*) that integrate the output of the accelerometer, and a transmitter (ref. #52)(refers to instant claimed a *movement analysis module / logic circuit*) that transmits the digital signals to the computer (ref. #57)(see e.g. col. 4, lines 1-34). The input device is a mouse which provide data from which a computer can ascertain the position of the mouse as its moves and use by a user to control the cursor on a computer display screen (refers to instant claim 2)(see e.g. col. 1, lines 26-36; claims 5 and 6).

For **claims 4 and 5**, Olson discloses that the electronic signal processing, transmitting, and receiving circuitry (ref. #26) comprises a voltage analysis module (see e.g. col. 8, lines 4-33; claims 6-7), a first direction correlation module, second direction correlation module, stationary correlation module, and a coordination module (ref. #32, 42, and 44 of fig. 4; col. 6, line 1 thru col. 8, line 3).

Therefore, the device of Olson does anticipate the instant claimed invention.

7. Claims 1 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Brooks (US Patent 5,434,371).

For *claims 1 and 13*, Brooks discloses an input device (refers to instant claimed an *image control accelerometer system*)(see e.g. Abstract; col. 1, lines 62-68; col. 3, lines 17-37). The device comprises an accelerometer sensor (ref. #20)(refers to instant claimed an *accelerometer module / accelerometer*), and the processing circuit (ref. #30) (see e.g. col. 3, lines 17 thru col. 4, lines 58; figs. 1-5). As illustrated in figure 6, the processing circuit comprises an acceleration detecting circuit (ref. #32)(refers to instant claimed a *movement analysis module / logic circuit*), and an interface (ref. #50)(refers to instant claimed an *input protocol generation module / input protocol generation component*) that transmits the digital data from the processing circuit receiver (ref. #60), i.e. computer (see e.g. col. 4, lines 20-31 and 48-51; col. 4, line 66 thru col. 5, line 4). The accelerometer sensor is for monitoring the distance, time, and changes in velocity for various directions or directional planes, and emits a signals corresponding to the movement of the input device to the processing circuit (see e.g. col. 3, lines 30-66; col. 4, lines 20-24; figs. 3-5).

Therefore, the device of Brooks does anticipate the instant claimed invention.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 1, 3, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brooks (US Patent 5,434,371) in view of Chau et al. (*Sensors and Actuators A*, 1996, vol. 54, pgs. 472-476).

For **claims 1 and 13**, Brooks discloses an input device (refers to instant claimed an *image control accelerometer system*)(see e.g. Abstract; col. 1, lines 62-68; col. 3, lines 17-37). The device comprises an accelerometer sensor (ref. #20)(refers to instant claimed an *accelerometer module / accelerometer*), and the processing circuit (ref. #30) (see e.g. col. 3, lines 17 thru col. 4, lines 58; figs. 1-5). As illustrated in figure 6, the processing circuit comprises an acceleration detecting circuit (ref. #32)(refers to instant claimed a *movement analysis module / logic circuit*), and an interface (ref. #50)(refers to instant claimed an *input protocol generation module / input protocol generation component*) that transmits the digital data from the processing circuit receiver (ref. #60), i.e. computer (see e.g. col. 4, lines 20-31 and 48-51; col. 4, line 66 thru col. 5, line 4). The accelerometer sensor is for monitoring the distance, time, and changes in velocity for various directions or directional planes, and emits a signals corresponding to the movement of the input device to the processing circuit (see e.g. col. 3, lines 30-66; col. 4, lines 20-24; figs. 3-5).

The teachings of Brooks differs from the presently claimed invention as follows:

For **claim 3, 15, and 16**, Brooks fail to a capacitive silicon accelerometer comprising a proof mass module and a capacitance/voltage conversion module.

However, Chau et al. teach the limitations that are deficient in Brooks

For **claims 3, 15, and 16**, Chau et al. disclose a polysilicon sensor (see e.g. Abstract; pg. 472, right col., line 1 thru pg. 473, left col., line 20). The polysilicon sensor is a capacitive

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accelerometer comprising a proof mass, spring, movable beams, fixed beams, and a capacitance/voltage conversion module (see e.g. pg. 472, right col., line 1 thru pg. 473, left col., line 20; pg. 473, right col., lines 8-17; figs. 1-3). The function of the polysilicon sensor is by applying a voltage across the fixed and movable beams and the variations in the capacitance changes the voltage (see e.g. pg. 473, left col., lines 4-16; fig. 2).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose a capacitive silicon accelerometer comprising a proof mass module and a capacitance/voltage conversion module as taught by Chau et al. in the device of Brooks. One of ordinary skill in the art would have been motivated to disclose a capacitive silicon accelerometer comprising a proof mass module and a capacitance/voltage conversion module in the device of Brooks for the advantage of providing an accelerometer with mg resolution, d.c. response, and low temperature drift (Chau: pg. 472, left col., lines 1-6). Furthermore, one of ordinary skill in the art would have a reasonable expectation of success in the combination of Brooks and Chau et al. because Brooks discloses that semiconductor based accelerometers are known in the art, and as a result the type of accelerometer use would be a choice of experimental design and is considered within the purview of the cited prior art (Brooks: col. 4, lines 5-13).

Therefore, the combine teachings of Brooks and Chau et al. do render the device of the instant claims *prima facie* obvious.

10. Claims 1-5 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson (US Patent 4,787,051) in view of Chau et al. (*Sensors and Actuators A*, 1996, vol. 54, pgs. 472-476).

For **claims 1, 2, 13, and 14**, Olson discloses an input device (refers to instant claimed an *image control accelerometer system*)(see e.g. Abstract; col. 2, lines 38-62). As illustrated in figure 1, the device comprises a set of accelerometers (ref. #14, 16, 18)(refers to instant claimed an *accelerometer module / accelerometer*), and an electronic signal processing, transmitting, and receiving circuitry (ref. #26)(see e.g. col. 4, lines 26-45; col. 4, lines 49 thru col. 5, line 22; claims 1 and 4-6). As illustrated in figure 4, the signal processing, transmitting, and receiving circuitry comprises integrators (ref. #32, 42, and 44)(refers to instant claimed a *movement analysis module / logic circuit*) that integrate the output of the accelerometer, and a transmitter (ref. #52)(refers to instant claimed a *movement analysis module / logic circuit*) that transmits the digital signals to the computer (ref. #57)(see e.g. col. 4, lines 1-34). The input device is a mouse which provide data from which a computer can ascertain the position of the mouse as its moves and use by a user to control the cursor on a computer display screen (refers to instant claim 2)(see e.g. col. 1, lines 26-36; claims 5 and 6).

For **claims 4 and 5**, Olson discloses that the electronic signal processing, transmitting, and receiving circuitry (ref. #26) comprises a voltage analysis module (see e.g. col. 8, lines 4-33; claims 6-7), a first direction correlation module, second direction correlation module, stationary correlation module, and a coordination module (ref. #32, 42, and 44 of fig. 4; col. 6, line 1 thru col. 8, line 3).

The teachings of Olson differs from the presently claimed invention as follows:

For **claim 3, 15, and 16**, Olson fail to a capacitive silicon accelerometer comprising a proof mass module and a capacitance/voltage conversion module.

However, Chau et al. teach the limitations that are deficient in Olson

For *claims 3, 15, and 16*, Chau et al. disclose a polysilicon sensor (see e.g. Abstract; pg. 472, right col., line 1 thru pg. 473, left col., line 20). The polysilicon sensor is a capacitive accelerometer comprising a proof mass, spring, movable beams, fixed beams, and a capacitance/voltage conversion module (see e.g. pg. 472, right col., line 1 thru pg. 473, left col., line 20; pg. 473, right col., lines 8-17; figs. 1-3). The function of the polysilicon sensor is by applying a voltage across the fixed and movable beams and the variations in the capacitance changes the voltage (see e.g. pg. 473, left col., lines 4-16; fig. 2).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose a capacitive silicon accelerometer comprising a proof mass module and a capacitance/voltage conversion module as taught by Chau et al. in the device of Olson. One of ordinary skill in the art would have been motivated to disclose a capacitive silicon accelerometer comprising a proof mass module and a capacitance/voltage conversion module in the device of Olson for the advantage of providing an accelerometer with mg resolution, d.c. response, and low temperature drift (Chau: pg. 472, left col., lines 1-6). Furthermore, one of ordinary skill in the art would have a reasonable expectation of success in the combination of Olson and Chau et al. because semiconductor based accelerometers are known in the art, and as a result the type of accelerometer use would be a choice of experimental design and is considered within the purview of the cited prior art.

Therefore, the combine teachings of Olson and Chau et al. do render the device and method of the instant claims *prima facie* obvious.

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11. Claims 1, 6, 7, 13, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glynn (US Patent 5,181,181) in view of Puckette (US Patent 3,793,589).

For **claims 1 and 13**, Glynn discloses a mouse (refers to instant claimed an *image control accelerometer system*), which senses the movement of the mouse within three dimensions such that a user can interact with a computer in three-dimensional space (see e.g. Abstract; col. 1, lines 6-21; col. 3, lines 3-18; col. 5, lines 4-56). As illustrated in figure 1, the mouse comprises a motion sensing assembly (ref. #2), an ancillary components area (ref. #3), and a plurality of push-buttons (ref. #4-6) that function to indicate a desire by the user to indicate a point, line, surface, volume or motion in space, or to select a menu item, cursor position or particular attitude (see e.g. col. 5, lines 4-56). As illustrated in figures 2-3, the motion sensing assembly that includes rotational rate sensors (ref. # 14-16) and accelerometers (ref. #17-19)(refers to instant claimed an *accelerometer module / accelerometer*)(see e.g. col. 6, lines 3-46; Claims 4, 5, 19, and 20; figs. 2-3). As illustrated in figure 4, the ancillary components area comprises a sensor interface circuits (ref. #31)(refers to instant claimed a *movement analysis module / logic circuit*) that reads and integrates the sensor signals from the motion sensing assembly, and interface ports (ref. #7-12)(refers to instant claimed an *input protocol generation module / input protocol generation component*) that provide communication with computer via the computer (see e.g. col. 5, lines 1-14; col. 6, line 32 thru col. 7, line 50; claims 4, 5, 19, and 20; fig. 4).

The teachings of Glynn differs from the presently claimed invention as follows:

For **claims 6, 7, and 17-20**, Glynn fail to disclose that the input protocol generation component is a quadrature waveform generator and the claimed characteristics/functions of the quadrature signal waveform, e.g. square wave.

However, Puckette teach the limitations that are deficient in Glynn as follows:

For *claims 6, 7, and 17-20*, Puckette discloses a data communication transmitter for high-speed transmission (see e.g. Abstract; col. 1, lines 3-7; col. 1, line 51 thru col. 2, line 15). The transmitter uses a vector waveform generator (refers to instant claimed quadrature waveform generator) that produces square waves that can be controlled over the entire 360° by proper selection of the in-phase and 90° out-of-phase functions (see e.g. col. 1, line 51 thru col. 2, line 15; col. 7, lines 25-56). The digital data source that provides the digital data signals to the transmitter includes the output of an analog-to digital converter (see e.g. col. 11, lines 52-57).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose that the input protocol generation component is a quadrature waveform generator and the claimed characteristics/functions of the quadrature signal waveform, e.g. square wave as taught by Puckette in the device of Glynn. One of ordinary skill in the art would have been motivated to disclose that the input protocol generation component is a quadrature waveform generator and the claimed characteristics/functions of the quadrature signal waveform, e.g. square wave in the device of Glynn for the advantage of providing the transmitter with a single waveform generator and without requiring any linear multipliers in the modulation process (Puckette: col. 1, lines 46-49). Furthermore, one of ordinary skill in the art would have a reasonable expectation of success in the combination of Glynn and Puckette because Glynn discloses that any type wireless communication techniques can be use by the interface ports, and as a result the type of input protocol generation component use would be a choice of experimental design and is considered within the purview of the cited prior art.

Therefore, the combine teachings of Glynn and Puckette do render the device of the instant claims *prima facie* obvious.

12. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson (US Patent 4,787,051) in view of Chau et al. (*Sensors and Actuators A*, 1996, vol. 54, pgs. 472-476).

For **claim 8 and 10-12**, Olson discloses an input device (refers to instant claimed an *image control accelerometer system*) that includes accelerometers (see e.g. Abstract; col. 2, lines 38-62). The input device is a mouse which provide data from which a computer can ascertain the position of the mouse as its moves and use by a user to control the cursor on a computer display screen (see e.g. col. 1, lines 26-36; claims 5 and 6). Olson also discloses the method of determining the movement of the input device in two-dimensional or three-dimensional space from the output signal of each accelerometer (see e.g. col. 2, line 38 thru col. 3, lines 32). The method comprises the steps of a) sensing movement of an accelerometer, b) associating said movement with a movement status; and c) indicating said movement status (see e.g. col. 4, line 49 thru col. 5, line 68; col. 10, lines 53-68; figs. 1 and 6). The method comprises the step of comparing the voltage level with a threshold value and associating it with the sensing movement of the accelerometer (see e.g. col. 8, lines 4-33). The direction of movement is up or down and left or right (see e.g. col. 4, lines 49-68; col. 10, lines 53-68; fig. 6).

The teachings of Olson differs from the presently claimed invention as follows:

For **claims 8 and 9**, Olson fail to disclose that the accelerometer a capacitive accelerometer comprising a proof mass and that the method step of using the capacitive accelerometer.

However, Chau et al. teach the limitations that are deficient in Olson as follows:

For *claims 8 and 9*, Chau et al. disclose a polysilicon sensor (see e.g. Abstract; pg. 472, right col., line 1 thru pg. 473, left col., line 20). The polysilicon sensor is a capacitive accelerometer comprising a proof mass, spring, movable beams, fixed beams, and a capacitance/voltage conversion module (see e.g. pg. 472, right col., line 1 thru pg. 473, left col., line 20; pg. 473, right col., lines 8-17; figs. 1-3). The function of the polysilicon sensor is by applying a voltage across the fixed and movable beams and the variations in the capacitance changes the voltage (see e.g. pg. 473, left col., lines 4-16; fig. 2).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose that the accelerometer a capacitive accelerometer comprising a proof mass and that the method step of using the capacitive accelerometer as taught by Chau et al. in the method of Olson. One of ordinary skill in the art would have been motivated to disclose that the accelerometer a capacitive accelerometer comprising a proof mass and that the method step of using the capacitive accelerometer in the method of Olson for the advantage of providing an accelerometer with mg resolution, d.c. response, and low temperature drift (Chau: pg. 472, left col., lines 1-6). Furthermore, one of ordinary skill in the art would have a reasonable expectation of success in the combination of Olson and Chau et al. because semiconductor based accelerometers are known in the art and as a result the type of accelerometer use would be a choice of experimental design and is considered within the purview of the cited prior art.

Therefore, the combine teachings of Olson and Chau et al. do render the method of the instant claims *prima facie* obvious.

Conclusion


13. No claims allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MY-CHAU T. TRAN whose telephone number is 571-272-0810. The examiner can normally be reached on Monday: 8:00-2:30; Tuesday-Thursday: 7:30-5:00; Friday: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard A. Hjerpe can be reached on 571-272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

My-Chau T. Tran
February 7, 2007


MY-CHAU T. TRAN
PATENT EXAMINER